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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,699	03/04/2002	Robert P. Mandal	AMAT/3771.P1/DD/LOW K/JW	7928

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APPLIED MATERIALS, INC.
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EXAMINER

RAO, SHRINIVAS H

ART UNIT PAPER NUMBER

2814

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,699	MANDAL, ROBERT P.	
	Examiner	Art Unit	
	Steven H. Rao	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5-8,16,18 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,5-8,16,18 and 21-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Receipt is acknowledged of paper submitted under 35 U.S.C. 131, claiming priority from U.S. Serial No. 10/091,699 filed on June 11, 2003 which itself claims priority from U.S. Serial No. 09/484,689 filed on January 18, 2000 papers have been placed of record in the file.

Request for Continued Examination Application

The request filed on 06/11/2003 for a Request for Continued Examination Application (RCE) under 37 CFR 1.114 based on parent Application No. 10/3091,699 is acceptable and a RCE has been established. An action on the RCE follows.

Information Disclosure Statement

Acknowledgment is made of receipt of Applicant's Information Disclosure Statement (PTO-1449) filed on May 16, 2003.

The references on PTO 1499 submitted on 05/16/ 2003 are acknowledged. All the cited references have been considered.

A copy of the initialed PTO-1449 has been placed in the file along with instructions to the contract staff to mail a copy of the same to the Applicants' along with instant Office Action.

Preliminary Amendment Status

Acknowledgment is made of entry of amendment filed on May 16, 2003 has been entered on June 12, 2003.

Therefore claims 1 and 5 as amended by the amendment and claims 21 to 25 presently newly added, and claims 6-8,16,18 as previously recited are currently pending in the Application.

Claims 2-4,9-15 and 17 have been cancelled by this amendment. Claims 19 and 20 were previously cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-8,16,18,21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grill (U.S. Patent No. 6,312, 793, herein after Grill) in view of Scholsky et al. (U.S. patent No. 5,010,166, herein after Scholsky)

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With respect to claim 1 Grill describes a method for depositing a low dielectric constant film including introducing a siloxane comprising two or more silicons and four or more methyl groups bonded to the silicons into a processing chamber (Grill col.3 lines 15-20).

Grill describes the introduction of at least one oxidizable chemical comprising an aldehyde without specifying the aldehyde to be a furfuryl or Furfuryloxy and noepentyl compounds.

However Scholsky in col. 16 lines 16 and 62 describes the use of furfuryl or Furfuryloxy and noepentyl compounds to form a low dielectric thermoset coating (film) having superior hardness , flexibility and impact resistance.

Therefore it would have been obvious to one of ordinary skill in the art to use Scholsky's aldehyde to be a furfuryl or Furfuryloxy and noepentyl compounds in place of Grill's unspecified aldehydes, etc. , the motivation to make the above substitution is to form a low dielectric thermoset coating (film) having superior hardness , flexibility and impact resistance. (Scholsky col.1 lines 35 to 38).

The remaining limitations of claim 1 are ;
reacting the siloxane and the at least one oxidizable chemical with an oxidizing gas at a temperature that retains the member in a conformal layer (Grill figs. 2A and B, col. 6 lines 54-61),and annealing the conformal layer at a temperature sufficient to convert the member to dispersed voids. (Grill col. 8 lines 29-30).

With respect to claim 5 it repeats the steps of claim1 above and wherein the one oxidizable chemical comprises silicon (Grill col. 3 line 14).

With respect to claims 6-7 wherein the oxidizable chemical is silane and the silane is dimethylfurfuryloxy silane (Grill col. 3 line 20).

With respect to claims 8 and 16 wherein the at least one oxidizable chemical is disiloxane: 1,3 dimethyl- 1,3- ditertiabutyl disiloxane and 1,3-dimethyl- 1,3-ditertiarybutoxy disiloxane ; 1,1,3,3-tetramethyldisiloxane, 1,3,5,7-tetramethylcyclotetrasiloxane ; 1,3-dimethyl-1,3-ditertiarybutyl disiloxane; 1,3-dimethyl-1,3-ditertiarybutoxy disiloxane . (Grill col. 3 lines 14-26 and Tsukane col. 7 lines 35-65).

With respect to claim 18, wherein the method further comprises depositing a silicon carbide layer on the conformal layer prior to annealing the conformal layer. (Grill col. 54-col. 6 lines 12).

With respect to claim 21, Grill describes the method of claim 1, wherein the at least one oxidizable chemical is difurfuryl ether. (Grill col.3 line 34-35).

With respect to claim 22, Grill describes a method of depositing a low dielectric constant film, including : introducing a siloxane comprising two or more silicones and four or more methyl groups bonded to the silicon in to a processing chamber (Grill col.3 lines 15-20) , introducing at least one oxidizable chemical comprising a cyclic ring consisting of carbon, oxygen and hydrogen into the processing chamber, (Grill col. 3 line 33) reacting the siloxane and the at least one oxidizable chemical with an oxidizing gas at a temperature that retains the cyclic ring in a conformal layer (Grill figs. 2A and B, col. 6 lines 54-61) converting the cyclic ring to dispersed voids(Grill col. 8 lines 29-30)

With respect to claim 23, Grill describes the method of claim 22, wherein the oxidizable chemical is selected from the group consisting of vinyl-1,4- dioxyvinyl ether,

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vinyl furyl ether, vinyl-1,4-dioxin, vinyl furan, methyl furoate, furyl formate, furyl acetate, furaldehyde, difuryl ketone, difuryl ether, difuryl ether, furan and 1,4-dioxin. (Scholsky col. 16 lines 16 and 62).

With respect to claim 24, wherein the oxidizable chemical is difurfuryl ether. (Scholsky col. 16 lines 16 and 62).

With respect to claim 25, Grill describes the method of claim 24, wherein the siloxane is selected from the group consisting of 1,1,3,3- tetramethyldisiloxane, 1,1,5,5- tetramethyltri siloxane and 1,1,3,5,5-pentamethyltri siloxane(Grill col. 3 lines 14-26) .

Response to Arguments

Applicant's arguments with respect to claims 1, 5-8,16,18,21-25 have been considered but are moot in view of the new ground(s) of rejection.

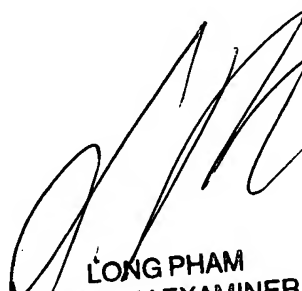
Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5945. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7722.


Steven H. Rao

Patent Examiner

August 11, 2003.


LONG PHAM
PRIMARY EXAMINER